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## **Statement of Requirement for the R-Cloud Advanced Materials Strategic Capability**

### **Introduction:**

The Defence Science and Technology Laboratory (Dstl), which is part of the UK Ministry of Defence (MOD), is refreshing its commercial agreement for Science and Technology (S&T) research contracts, known as R-Cloud (Research Cloud).

MOD places extensive fundamental, experimental and applied research with industry and academic suppliers and wants to broaden access for this supply base, reducing the cost of trading with MOD and enabling agile contracting. R-Cloud complements MOD's other contracting mechanisms and academic and industry suppliers of S&T research are now invited to apply to join MOD's research supplier community within the Advanced Materials Strategic Capability.

This statement of requirement relates to suppliers joining R-Cloud within the Advanced Materials capability area. R-Cloud provides a low barrier to entry for potential suppliers and offers direct access to MOD's current and future research requirements. Academic and industrial suppliers of Advanced Materials research are invited to apply to R-Cloud if you are a supplier of Science and Technology Research in this area.

Advanced Materials encompasses a broad range of technical areas, not limited to but including:

- Simulation, prototyping & experimentation
- Processing & manufacturing technology
- Materials characterisation & forensics
- Low observable materials
- Materials state awareness
- Structural materials
- Electronic, photonic & functional materials.



**Statement of Requirement:**

The Strategic Capability Area (SCA) for Advanced Materials covers all aspects of materials and structures research including **materials selection and performance, manufacture, integration into structures, material ageing, operating environment, shock and impact resistance, physical performance, corrosion, design and lifing**. The capability covers most types of materials including **electronic and photonic materials, metals (and their alloys), polymers, ceramics, composites and functional materials**. Energetic materials and CBR protection materials are covered by their SCAs respectively.

The sub-capability elements for the Advanced Materials SCA are as follows:

SUB-ELEMENT NAME	SUB-ELEMENT DESCRIPTION
The materials continuum (simulation, prototyping, characterisation, test & experimentation tools, processing & manufacturing technology).	Numerical simulation in order to understand and model in silico complex systems. Prototyping and precision experimentation to increase the maturity of materials solutions to solve many defence and security problems at the low (<5) TRL level. At higher TRLs, materials state awareness, including the understanding of the degradation and ageing of materials to support defence platforms and equipment through-life or under hostile action. S&T in new and advanced manufacturing techniques.
Low observable materials	Low observable materials provide options for signature management across all parts of the electromagnetic and acoustic spectra (e.g. radio frequency, electro-optic, infra-red, acoustic).
Structural materials & integration	Structural materials are materials used or studied primarily for their mechanical properties, as opposed to their electronic, magnetic, chemical or optical characteristics. This capability element also supports the integration of materials into current and future platforms.
Electronic, photonic & functional materials	Electronic materials (developed for their specific conducting or semi-conducting properties), and photonic materials (developed specifically for their optical properties). Functional materials are defined as those materials that perform specific functions (exploiting properties such as magnetic or dielectric behaviour) other than possessing a load bearing



Advanced  
Materials

	<p>capacity. These include smart materials and systems, which can sense and respond to the environment around them in a predictable and useful manner.</p>
<p>Risk &amp; compliance</p>	<p>Resource security (for example, so-called 'critical' materials), hazardous materials use and associated regulation, such as (but not limited to) compliance with REACH, Montreal Protocol and United Nations regulations (UNEP).</p>